The United States has the largest transportation system in the world. It serves 260 million people and 6 million business establishments spread over the fourth largest country (in land area) in the world. This report provides a snapshot of the transportation system, highlighting its physical characteristics and trends in passenger travel and freight movement, and examining transportation's economic performance, its safety record, energy use, and environmental impacts.[1]

As users and customers of the transportation system, few of us notice anything but a small part of the system unless we are caught in a traffic jam, suffer or read about an accident, or sit in a plane delayed on the runway. We buy fresh fruits and vegetables in mid-winter, send packages on overnight delivery, fly cross country to solve a business crisis, move hundreds or thousands of miles to a new job knowing we can easily return often to visit family, send our children to distant colleges, and take it all for granted. Some of us even travel 1,000 miles on special flights to shop, or enjoy weekend respites half a continent away. None of this would be possible without a complex network of road, rail, water, pipeline, and air routes blanketing the country, which, for the most part, works well.

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Long before the communications revolution, freedom to travel helped to bind the nation together. And freedom to travel is more than a physical ability; travel must also be affordable enough so that anyone can travel extraordinary distances frequently, by historical standards. There was a

[1] A more detailed assessment is published by the Bureau of Transportation Statistics (BTS) in the *Transportation Statistics Annual Report.* To obtain this and other BTS products, see ordering information at the end of this report.

time when it was not uncommon for people to travel no more than 20 miles from their birthplace during their lifetime; now that is difficult to imagine. Mobility and remarkable access to economic and social opportunities are made possible by the U.S. transportation system. The system consists of not only vehicles and an extensive physical infrastructure, but also the intellectual capital of its large workforce, and the agencies that administer transportation programs and regulations. Increasingly, information technologies, including telecommunications, computers, and global positioning systems, are used in all aspects of the transportation system.

The distance traveled by the average car or light truck in the United States in 1995 equaled a journey nearly halfway around the earth.

The sheer physical size of the transportation system is difficult to comprehend (see table 1). Its 4 million miles of roads would circle the globe more than 157 times, or go to the moon and back more than 8 times. Its rail lines would circle the globe nearly 7 times, and the oil and gas pipelines nearly 56 times. In 1995, cars and light trucks—the vast majority of them personal vehicles—were driven 2.2 trillion miles in the United States. This is literally an astronomical distance, nearly one-tenth of the distance to the nearest star outside our solar system. A more down-to-earth measure: the distance traveled by the average car or light truck in the United States in 1995 equaled a journey nearly halfway around the earth.

Transportation is a major component of the economy, accounting for nearly 11 percent of gross domestic product (GDP)—more than education, but less than food and health care (see figure 1). It provides the links between businesses, industries, and consumers. Transportation and related industries employ 9.9 million people in the United States—slightly more than 7 percent of the total civilian labor force.

The economic importance of the U.S. transportation system goes well beyond our borders. It affects the ability of U.S. businesses to compete in the expanding global economy. Over time, international trade has grown in importance as a component of the U.S. economy. The ratio of the sum of U.S. exports and imports to U.S. GDP shows this trend clearly.[2] In 1995, total exports and imports of goods and services amounted to 24.7 percent of GDP, compared with 11.3 percent in 1970. Commodities trade, which is more closely relat-

[2] GDP measures the size of the economy, and the sum of exports and imports measures the size of the international trade component of the economy. The ratio of the sum of U.S. exports and imports to GDP should not be confused with the share of international trade as a component of GDP. The latter measures the net value of exports minus imports as a component of GDP.

TABLE 1.
MAJOR ELEMENTS OF THE TRANSPORTATION SYSTEM, 1995

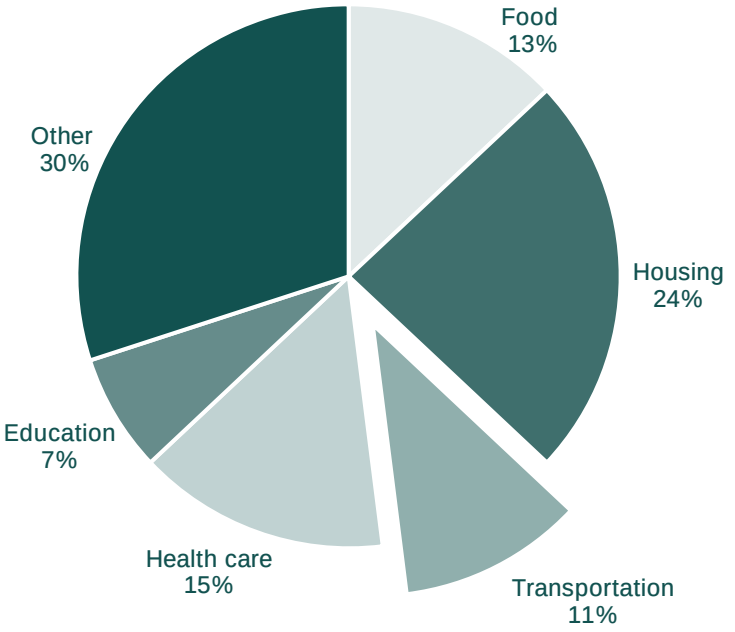
Mode	Major defining elements	Components
Highways[a]	Public roads and streets; automobiles, vans, trucks, motorcycles, taxis, and buses (except local transit buses) operated by transportation companies, other businesses, governments, and households; garages, truck terminals, and other facilities for motor vehicles	*Roads* 45,744 miles of Interstate highway 111,237 miles of other National Highway System roads 3,755,245 miles of other roads *Vehicles and use* 136 million cars, driven 1.5 trillion miles 58 million light trucks, driven 0.7 trillion miles 6.9 million freight trucks, driven 0.2 trillion miles 686,000 buses, driven 6.4 billion miles
Air	Airways and airports; airplanes, helicopters, and other flying craft for carrying passengers and cargo	*Public use airports* 5,415 airports *Airports serving large certificated carriers*[b] 29 large hubs (67 airports), 393 million enplaned passengers 33 medium hubs (59 airports), 86 million enplaned passengers 58 small hubs (73 airports), 34 million enplaned passengers 561 nonhubs (593 airports), 14 million enplaned passengers *Aircraft* 5,567 certificated air carrier aircraft, 4.6 billion miles flown* *Passenger and freight companies* 86 carriers, 506 million domestic revenue passenger enplanements, 12.5 billion domestic ton-miles of freight* *General aviation* 171,000 aircraft, 2.9 billion miles flown[c]
Rail[d]	Freight railroads and Amtrak	*Railroads* 125,072 miles of major (Class I) 18,815 miles of regional 26,546 miles of local *Equipment* 1.2 million freight cars 18,812 locomotives *Freight railroad firms* Class I: 11 companies, 188,215 employees, 1.3 trillion ton-miles of freight carried Regional: 30 companies, 10,647 employees Local: 500 companies, 13,269 employees *Passenger (Amtrak)* 23,646 employees, 1,921 passenger cars, 356 locomotives, 20.7 million passengers carried
Transit[e]	Commuter trains, heavy-rail (rapid-rail) and light-rail (streetcar) transit systems, local transit buses, vans and other demand response vehicles, and ferryboats	*Vehicles* 43,723 buses, 17.2 billion passenger-miles 9,046 rapid rail and light rail, 11.5 billion passenger-miles 4,349 commuter rail, 8.0 billion passenger-miles 86 ferries, 243 million passenger-miles 12,828 demand response, 377 million passenger-miles
Water	Navigable rivers, canals, the Great Lakes, St. Lawrence Seaway, Intercoastal Waterway, ocean shipping channels; ports; commercial ships and barges, fishing vessels, and recreational boating	*U.S.-flag domestic fleet*[f] Great Lakes: 698 vessels, 60 billion ton-miles Inland: 31,910 vessels, 306 billion ton-miles Ocean: 7,033 vessels, 440 billion ton-miles *Ports*[g] Great Lakes: 362 terminals, 507 berths Inland: 1,811 terminals Ocean: 1,578 terminals, 2,672 berths
Pipeline[h]	Crude oil, petroleum product, and natural gas lines	*Oil* Crude lines: 114,000 miles of pipe, 323 billion ton-miles transported Product lines: 86,500 miles of pipe, 269 billion ton-miles transported 161 companies, 14,900 employees *Gas* Transmission: 276,000 miles of pipe Distribution: 919,000 miles of pipe 19.7 trillion cubic feet, 150 companies, 187,200 employees

[a] U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 1995* (Washington, DC: 1996).
[b] U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airport Activity Statistics of Certificated Air Carriers, 12 Months Ending December 31, 1995* (Washington DC: 1996).
[c] Data for 1994.
[d] All numbers are from Association of American Railroads, *Railroad Facts* (Washington, DC: 1996), except Amtrak figures from National Railroad Passenger Corporation, *1995 Annual Report* (Washington, DC: 1996).
[e] Data for 1994. U.S. Department of Transportation, Federal Transit Administration, *National Transit Summaries and Trends for the 1994 National Transit Database, Section 15 Report Year* (Washington, DC: 1996). Figures exclude transit for nonurbanized areas (Section 18, Federal Transit Act).
[f] Vessel data from U.S. Army Corps of Engineers, *Transportation Lines of the United States* (New Orleans, LA: 1996); ton-miles data from U.S. Army Corps of Engineers, *Waterborne Commerce of the United States 1995* (New Orleans, LA: 1996).
[g] Ports data from U.S. Department of Transportation, Maritime Administration, *A Report to Congress on the Status of the Public Ports of the United States 1994–1995* (Washington, DC: October 1996).
[h] Data for 1994.

*Preliminary data.

SOURCE: Unless otherwise noted, U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1997* (Washington, DC: 1996).

FIGURE 1. U.S. GROSS DOMESTIC PRODUCT BY MAJOR SOCIAL FUNCTION, 1995



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, various issues, 1996.

ed to freight movement, also more than doubled its ratio to GDP—from 8.1 percent in 1970 to 19.5 percent in 1995. The volume of trade also grew rapidly in absolute terms: for example, waterborne commerce in the United States involving foreign trade increased from 581 million tons in 1970 to over 1.1 billion in 1995.

The benefits of our transportation system do not come without costs: lives lost and shattered in accidents, dependence on foreign sources of oil, pollution of air and water, and the frustrations of congestion. Although safety, energy efficiency, and emissions controls have improved, transportation policies, regulations, and technological advances are still racing to keep up with the continual growth in travel and goods movement.

The ability of the transportation system to meet our logistical and personal mobility needs with a minimum impact on our pocketbooks, our safety, and the environment depends on informed decisions by public agencies, private enterprise, and individuals. Because transportation and the world it serves are constantly changing, informed decisions require continual updating of our understanding of the transportation system, how it is used, what it contributes, and what it affects. This report summarizes our present understanding.

PASSENGER TRAVEL

Between 1970 and 1995, passenger travel nearly doubled in the United States, growing by an average of 2.7 percent a year. Passenger-miles per person increased during this time from 11,400 miles to 17,200 miles. In terms of absolute-miles traveled, the rise in automobile use overshadowed all other modes, growing by over 1 trillion passenger-miles during this period. Passenger-miles in light-duty trucks (including pick-ups, sport utility vehicles, and minivans) grew nearly fivefold.

Air travel more than tripled from 118 billion passenger-miles in 1970 to 415 billion in 1995, an annual growth rate of about 5 percent. Mass transit travel rose from 6.5 billion unlinked trips at its nadir in 1972 to 8 billion in 1980 and fluctuated around that level through the 1980s. In 1994, unlinked trips totaled 7.7 billion. One form of mass transit, commuter rail, continued to grow, increasing from 260 million unlinked trips in 1975 to 338 million in 1994.

Causes of Growth

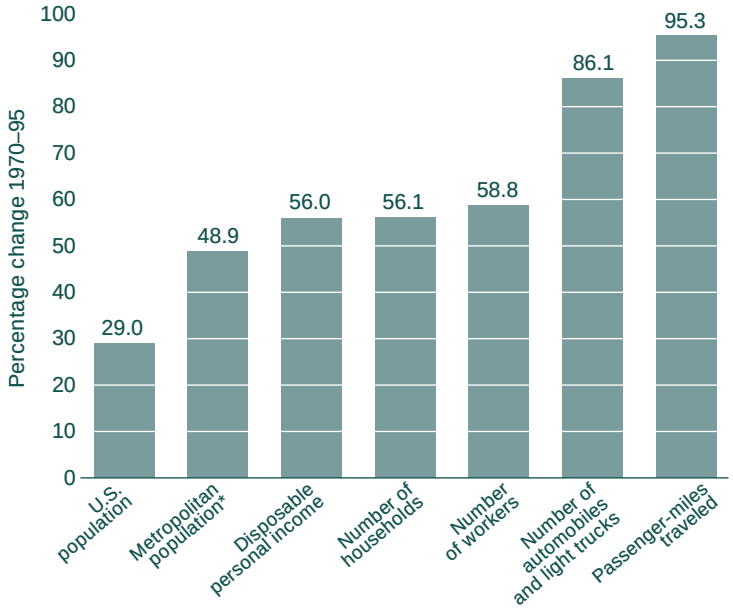
The extraordinary growth in passenger travel cannot be explained simply by the growth in the U.S. population, which rose by only 28 percent during the 1970 to 1995 period, as travel soared by 95 percent. Rather, changes in the labor force, income, the makeup of metropolitan areas, and other factors increased travel (see figure 2).

Passenger travel is growing faster than the population.

During the last quarter century, as baby boomers and women poured into the workplace, the civilian labor force increased by 59 percent, from 83 million to 132 million. The number of women working outside the home nearly doubled, from approximately 32 million to about 61 million. More people working means more people commuting and traveling. The Nationwide Personal Transportation Survey found that, in 1990, employed persons with a license drove 15,280 miles compared with 8,048 miles for those unemployed.

From 1970 to 1995, the number of households increased by 56 percent, nearly twice as much as the increase in population would suggest. The reason: household size decreased

FIGURE 2. CHANGES IN PASSENGER-MILES TRAVELED AND FACTORS AFFECTING TRAVEL DEMAND, 1970–95



*1970–1994.

SOURCES: Adapted from U.S. Department of Transportation, *1995 Status of the Nation's Surface Transportation System: Condition and Performance* (Washington, DC: Oct. 27, 1995); U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1996* (Washington, DC: U.S. Government Printing Office, 1996); and various sources as compiled and cited in U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1997* (Washington, DC: December 1996).

from 3.14 people in 1970 to 2.65 in 1995. More households translate into more trips for shopping, recreation, and taking care of children's needs.

Increases in the number of motor vehicles also contributed to the growth in passenger-miles. The number of automobiles and light trucks grew from 107 million in 1970 to 191 million in 1994. This increase is partly related to income growth. Disposable personal income per capita rose from $9,900 in 1970 to $14,700 in 1994 (in constant 1987 dollars). When people have more money to spend, they spend more on transportation, particularly on personal vehicles and long-distance travel.

Changes in locations where people live, work, and shop increased travel and the dependence on private vehicles. Between the 1970 and 1990 censuses, the population in metropolitan areas grew from 140 million to 189 million. Between 1980 and 1990, the central cities lost 500,000 people, while the suburbs gained 17.5 million. At the same time, the suburban share of jobs rose from 37 percent to 42 percent.

TABLE 2.
FACTORS AFFECTING
FUTURE TRANSPORTATION DEMAND

Factor	Comments
Forces of stability	
Population growth	Slow overall growth (approximately 1 percent annually), but higher than most western European countries.
Household formation	Leveling off.
Migration patterns	Slowing of internal migration to growth areas of South and West.
Employment	Slower growth in the labor force.
Women's labor force participation	Slower growth as it approaches that of men's participation.
Vehicle availability	Reaching saturation levels.
Forces of change	
Immigration	Possibly large, with immediate impact on transportation systems.
Aging	Baby boomers coming into prime traveling age: large impact on long-distance domestic and international travel. Retirement decisions, particularly of baby boomers, in 10 to 15 years may also alter commuting patterns and total travel.
Residential and job dispersal	Continued dispersal will lead to more travel, particularly single-occupancy vehicles.
Income	Slow increases in income, but large increases in travel by the low-income population.
Women's travel	Increasing travel by women, not related to having a driver's license or labor force participation.
Work-at-home/telecommuting	Uncertain.

The shift in the location of jobs changed travel patterns. Suburb-to-suburb commutes in 1990 accounted for 44 percent of all metropolitan commutes, while suburb-to-downtown made up only 20 percent. As metropolitan areas expanded and low-density suburbs spread into rural areas, mass transit struggled to provide the same level of service as in higher density city cores. Thus, private vehicle trips soared, as they offered the most direct connections for many suburb-to-suburb commutes by passengers.

Because of these and other factors, passenger travel is likely to continue to increase, although at a more moderate pace. Table 2 summarizes factors that may contribute to future transportation demand.

THE MOVEMENT OF FREIGHT

A modern industrial society depends on the movement of goods of all kinds, from food to iron ore, petroleum, and aluminum, to furniture, computers, and paper. In 1993, the U.S. transportation system carried more than 12 billion tons of goods, and, in so doing, generated a total of 3.6 trillion ton-miles. On a typical day in 1993, approximately 33 million tons